

ATTORNEY DOCKET NO. 047763-5017-US

Application No.: 09/673,305

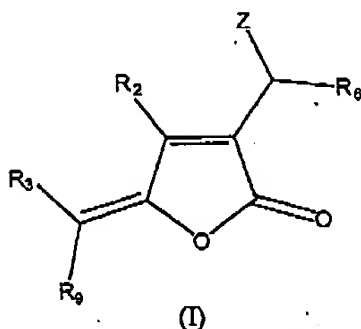
Page 2

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A compound according to formula (I):



wherein  $R_6$  is H, OH, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl;

$R_2$  and  $R_3$  are independently or both H or halogen;

$R_9$  is halogen;

Z is independently selected from  $R_6$ , halogen,  $OC(O)R_6$ ,  $=O$ , amine, azide, thiol, mercaptoalkyl, alkenyloxy, mercaptoalkenyl, aryloxy, mercaptoaryl, arylalkyloxy, mercaptoarylalkyl,  $SC(O)R_6$ ,  $OS(O)R_6$ ,  $OS(O)_2R_6$ ,  $NHC(O)R_6 = NR_4$  or  $NHR_4$ ;

$R_4$  is OH, alkyl, alkoxy, poly(ethylene glycol), alkenyl, aryl or arylalkyl; and

wherein each ~~constituent~~ substituent can be substituted or unsubstituted, straight chain or branched chain, and either hydrophobic, or hydrophilic or fluorophilic;

provided that:

when  $R_6$  is propyl,  $R_2$  is Br,  $R_3$  is H or Br and  $R_9$  is Br, then Z is other than H,  $OC(O)CH_3$  or OH;

when  $R_6$  is propyl,  $R_2$  is Br,  $R_3$  is H and R is I, then Z is other than  $OC(O)CH_3$  or OH;

when  $R_6$  is propyl,  $R_2$  is Br,  $R_3$  is H and R is Cl, then Z is other than OH;

when  $R_6$  is propyl,  $R_2$  is H,  $R_3$  and R are Br, then Z is other than H; and

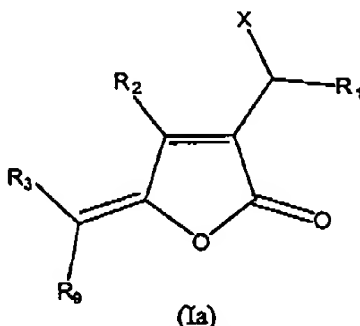
when  $R_6$  is propyl,  $R_2$  is Br,  $R_9$  is Cl and Z is H, then  $R_3$  is other than Cl.

ATTORNEY DOCKET NO. 047763-5017-US

Application No.: 09/673,305

Page 3

Claim 2 (currently amended): A compound according to formula (Ia):



wherein R<sub>1</sub> is hydrogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl;

X is a halogen, OH, OC(O)R<sub>1</sub> or =O;

R<sub>2</sub> and R<sub>3</sub> are independently or both hydrogen or halogen;

R<sub>9</sub> is halogen; and

wherein each ~~constituent~~ substituent can be substituted or unsubstituted, straight chain or branched chain, and either hydrophobic, or hydrophilic or fluorophilic;

provided that:

when R<sub>1</sub> is propyl, R<sub>2</sub> is Br, R<sub>3</sub> is H or Br and R<sub>9</sub> is Br, then X is other than OC(O)CH<sub>3</sub> or OH;

when R<sub>1</sub> is propyl, R<sub>2</sub> is Br, R<sub>3</sub> is H and R<sub>9</sub> is I, then X is other than OC(O)CH<sub>3</sub> or OH;  
and

when R<sub>1</sub> is propyl, R<sub>2</sub> is Br, R<sub>3</sub> is H, R<sub>9</sub> is Cl, then X is other than OH.

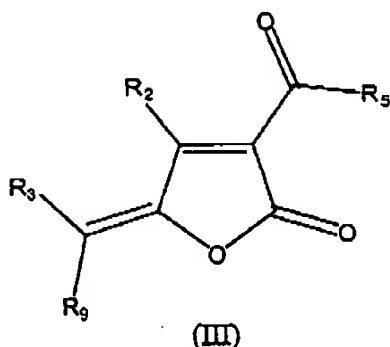
Claim 3 (canceled)

3/ Claim 4 (currently amended): A compound according to formula (III):

ATTORNEY DOCKET NO. 047763-5017-US

Application No.: 09/673,305

Page 4



wherein R<sub>2</sub> and R<sub>3</sub> are independently or both hydrogen or halogen;

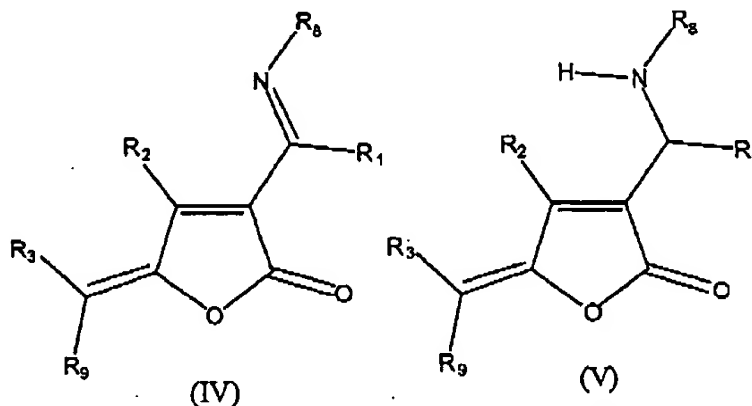
R<sub>5</sub> is OH or the same as R<sub>1</sub>;

R<sub>9</sub> is halogen;

R<sub>1</sub> is hydrogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl; and

wherein each constituent substituent can be substituted or unsubstituted, straight chain or branched chain, and either hydrophobic, or hydrophilic or fluorophilic.

4/  
Claim 5 (currently amended): A compound according to formula (IV) or (V):



wherein R<sub>1</sub> is hydrogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl;

R<sub>2</sub> and R<sub>3</sub> are independently or both hydrogen or halogen;

R<sub>9</sub> is halogen;

R<sub>8</sub> is OH, NHR<sub>1</sub>, NHC(X)NH<sub>2</sub>, NHC(X)NHR<sub>1</sub> or R<sub>1</sub> where X is O, S or NR<sub>1</sub>; and

wherein each constituent substituent can be substituted or unsubstituted, straight chain or

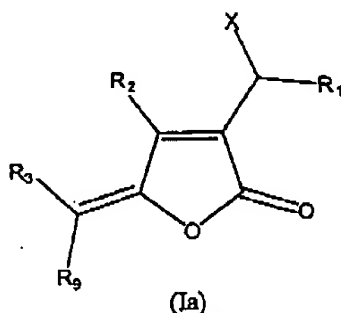
ATTORNEY DOCKET NO. 047763-5017-US

Application No.: 09/673,305

Page 5

branched chain, and either hydrophobic, or hydrophilic or fluorophilic.

5/  
Claim 6 (previously presented): A method for forming a compound of formula (Ia), comprising reacting a fimbrolide with a halogenating agent and/or an oxygenating agent to form the compound of formula (Ia):



wherein R<sub>1</sub> is hydrogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl;

X is a halogen, OH, OC(O)R<sub>1</sub> or =O;

R<sub>2</sub> and R<sub>3</sub> are independently or both hydrogen or halogen; and

R<sub>9</sub> is halogen.

6/ 5/  
Claim 7 (original): A method according to claim 6 wherein the halogenating agent is selected from the group N-bromosuccinimide, N-chlorosuccinimide, N-iodosuccinimide, bromine, cupric bromide, and phenyltrimethylammonium perbromide.

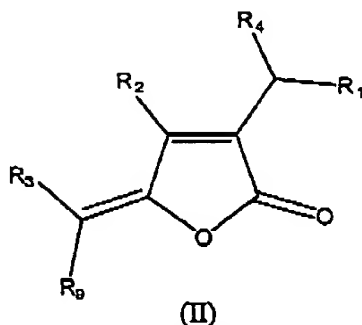
7/ 5/  
Claim 8 (original): A method according to claim 6 wherein the oxygenating agent is selected from lead tetraacetate, Rose Bengal/oxygen gas, hydrogen peroxide/vanadium pentoxide, selenium dioxide, and 3-chloroperoxybenzoic acid.

8/  
Claim 9 (currently amended) A method for forming a compound of formula II, comprising displacing and/or functionalizing a halogen or oxygen substituent in the side chain of a fimbrolide compound by treating the fimbrolide compound with a nucleophile or an electrophile to form the compound of formula (II):

ATTORNEY DOCKET NO. 047763-5017-US

Application No.: 09/673,305

Page 6



wherein R<sub>1</sub> is hydrogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl;

R<sub>2</sub> and R<sub>3</sub> are independently or both hydrogen or halogen;

R<sub>9</sub> is halogen; and

R<sub>4</sub> is selected from halogen, amine, azide, hydroxyl, thiol, alkyl, alkoxy, mercaptoalkyl, alkenyloxy, mercaptoalkenyl, aryloxy, mercaptoaryl, arylalkyloxy, mercaptoarylalkyl, OC(O)R<sub>1</sub>, SC(O)R<sub>1</sub>, OS(O)R<sub>1</sub>, OS(O)<sub>2</sub>R<sub>1</sub>, NHC(O)R<sub>1</sub>, OC(O)NHR<sub>1</sub>, or =O;

wherein each ~~constituent~~ substituent can be substituted or unsubstituted, straight chain or branched chain, and either hydrophobic, or hydrophilic or fluorophilic;

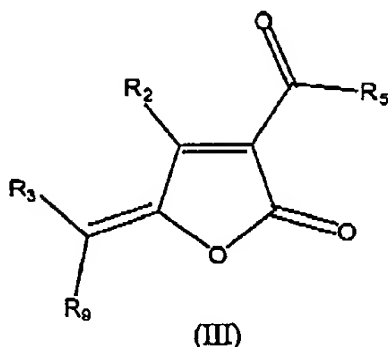
provided that when R<sub>4</sub> is propyl, R<sub>2</sub> is Br, R<sub>3</sub> and R<sub>9</sub> are Cl, then R<sub>1</sub> is other than H.

9/ Claim 10 (original): A method according to claim 9 wherein the nucleophile is selected from metal halides, water, organic metal carboxylate, organic alcohols, dimethyl sulfoxide, and organonitrile/acid catalyst, and silver triflate.

10/ Claim 11 (original): A method according to claim 9 wherein the electrophile is selected from organic acids, isocyanates, acid halides or active acylating agents such as carbonyl imidazoles or anhydrides (including activated hydrophilic PEG acids, PEG acid chlorides, PEG-oxycarbonylimidazoles and PEG-isocyanates) organic sulfonyl chlorides, and diethylaminosulfur trifluoride.

11/ Claim 12 (previously presented): A method for forming a compound of formula (III), comprising reacting an hydroxyl substituent in the side chain of a fimbrolide with an oxidising agent to form the compound in accordance with formula (III):

ATTORNEY DOCKET NO. 047763-5017-US  
Application No.: 09/673,305  
Page 7



wherein R<sub>2</sub> and R<sub>3</sub> are independently or both hydrogen or halogen;

R<sub>5</sub> is OH or the same as R<sub>1</sub>;

R<sub>9</sub> is halogen;

R<sub>1</sub> is hydrogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl; and

wherein each ~~constituent~~ substituent can be substituted or unsubstituted, straight chain or branched chain, and either hydrophobic, or hydrophilic or fluorophilic.

<sup>12/</sup> Claim 13 (original): A method according to claim 12 wherein the oxidising agents is selected from the group consisting of acid dichromate reagents in any form which may be free or polymer supported, chromium trioxide, manganese dioxide, potassium permanganate, selenium dioxide, ceric ammonium nitrate, ruthenium tetroxide, and hot nitric acid.

<sup>13/</sup> Claim 14 (previously presented): A method according to claim <sup>12/</sup>13, wherein the acid dichromate agent is selected from the group consisting of a Jones reagent, pyridinium chlorochromate, and pyridinium dichromate.

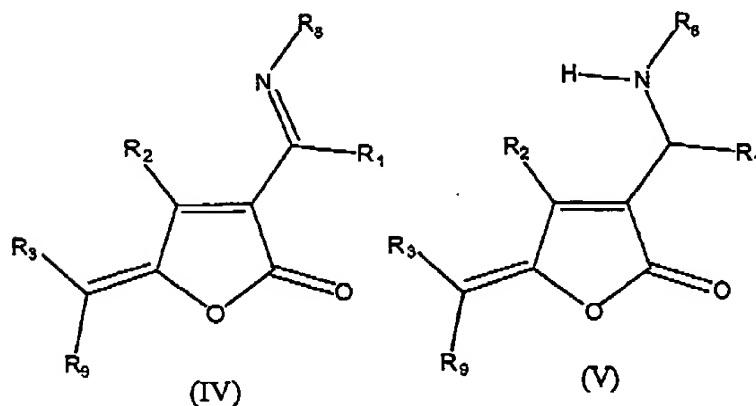
<sup>14/</sup> Claim 15 (currently amended): A method for forming a compound of formula (IV) or (V), comprising reacting an aldehyde or ketone substituent in the side chain -C(O)R<sub>5</sub> of compound (III) with an amine to form a compound of formula (IV) or (V),

wherein formula (IV) and (V) are represented by:

ATTORNEY DOCKET NO. 047763-5017-US

Application No.: 09/673,305

Page 8



wherein  $R_1$  is hydrogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl;

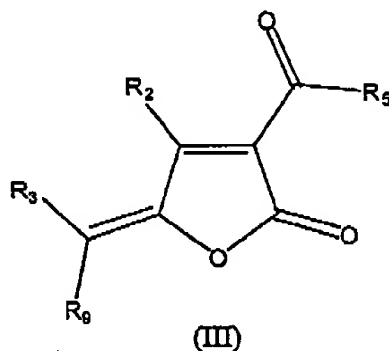
$R_2$  and  $R_3$  are independently or both hydrogen or halogen;

$R_9$  is halogen;

$R_8$  is OH,  $NHR_1$ ,  $NHC(X)NH_2$ ,  $NHC(X)NHR_1$  or  $R_1$  where X is O, S or  $NR_1$ ; and

wherein each constituent substituent can be substituted or unsubstituted, straight chain or branched chain, and either hydrophobic, or hydrophilic or fluorophilic;

and wherein formula (III) is represented by:



wherein  $R_2$  and  $R_3$  are independently or both hydrogen or halogen;

$R_5$  is OH or the same as  $R_1$ ; and

$R_9$  is halogen.

ATTORNEY DOCKET NO. 047763-5017-US

Application No.: 09/673,305

Page 9

**15**  
Claim 16 (previously presented): A method according to claim 13, wherein the amine is selected from hydroxyl amine hydrochloride, alkyl and aryl hydrazines, alkyl or aryl amine, optionally in the presence of a reducing agent.

**16**  
Claim 17 (previously presented): A compound produced by the method of claim 6. **5**

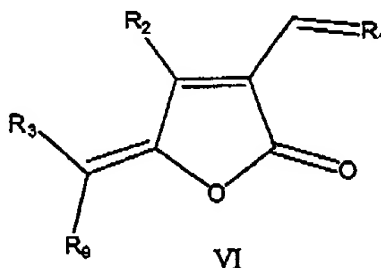
Claims 18-21 (canceled)

**17**  
Claim 22 (previously presented): An antimicrobial, antiseptic and/or microbacterial static composition including at least one compound in accordance with claim 1.

**18**  
Claim 23 (previously presented): An antifouling composition including at least one compound in accordance with claim 1.

Claim 24 (canceled)

**19**  
Claim 25 (currently amended): A compound of formula (VI):



wherein R<sub>1</sub> is alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl;

R<sub>2</sub> and R<sub>3</sub> are independently or both hydrogen or halogen;

R<sub>4</sub> is halogen; and

wherein each constituent substituent can be substituted or unsubstituted, straight chain or branched chain, and either hydrophobic, or hydrophilic or fluorophilic;



ATTORNEY DOCKET NO. 047763-5017-US

Application No.: 09/673,305

Page 10

20/  
19/  
Claim 26 (original): A compound according to claim 25 which is 4-Bromo-5-(bromomethylene)-3-(1-butenyl)-2(5H)-furanone.

21/  
8/  
Claim 27 (previously presented): A compound produced by the method in accordance with claim

22/  
11/  
Claim 28 (previously presented): A compound produced by the method in accordance with claim

23/  
Claim 29 (previously presented): A compound produced by the method in accordance with claim 15.

Claims 30-34 (canceled)

24/  
Claim 35 (previously presented): An antimicrobial, antiseptic and/or microbial static composition including at least one compound in accordance with claim 17.

Claim 36 (canceled)

25/  
Claim 37 (previously presented): An antimicrobial, antiseptic and/or microbial static composition including at least one compound in accordance with claim 27.

26/  
Claim 38 (previously presented): An antimicrobial, antiseptic and/or microbial static composition including at least one compound in accordance with claim 28.

27/  
Claim 39 (previously presented): An antimicrobial, antiseptic and/or microbial static composition including at least one compound in accordance with claim 29.

ATTORNEY DOCKET NO. 047763-5017-US

Application No.: 09/673,305

Page 11

28/  
Claim 40 (previously presented): An antifouling composition including at least one compound in accordance with claim 17.

Claim 41 (canceled)

29/  
Claim 42 (previously presented): An antifouling composition including at least one compound in accordance with claim 27.

30/  
Claim 43 (previously presented): An antifouling composition including at least one compound in accordance with claim 28.

31/  
Claim 44 (previously presented): An antifouling composition including at least one compound in accordance with claim 29.

32/  
Claim 45 (previously presented): A surface coating composition incorporating at least one compound in accordance with claim 17.

Claim 46 (canceled).

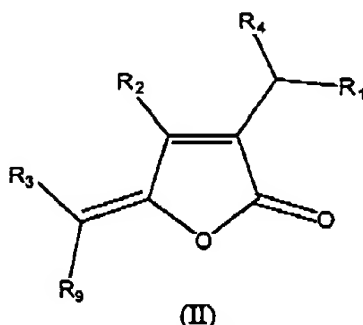
33/  
Claim 47 (previously presented): A surface coating composition incorporating at least one compound in accordance with claim 27.

34/  
Claim 48 (previously presented): A surface coating composition incorporating at least one compound in accordance with claim 28.

35/  
Claim 49 (previously presented): A surface coating composition incorporating at least one compound in accordance with claim 29.

36/  
Claim 50 (new): A compound according to formula (II):

ATTORNEY DOCKET NO. 047763-5017-US  
Application No.: 09/673,305  
Page 12



wherein  $R_1$  is hydrogen, alkyl, alkoxy, oxoalkyl, alkenyl, aryl or arylalkyl;

$R_2$  and  $R_3$  are independently or both hydrogen or halogen;

$R_9$  is halogen;

$R_4$  is selected from halogen, amine, azide, hydroxyl, thiol, or hydrophobic, hydrophilic or fluorophilic alkyl, alkoxy, mercaptoalkylalkenyloxy, mercaptoalkenyl, aryloxy, mercaptoaryl, arylalkyloxy, mercaptoarylalkyl,  $OC(O)R_1$ ,  $SC(O)R_1$ ,  $OS(O)R_1$ ,  $OS(O)_2R_1$ ,  $NHC(O)R_1$ ,  $OC(O)NHR_1$ , or  $=O$ ; and

wherein each substituent can be substituted or unsubstituted, straight chain or branched chain, and either hydrophobic, or hydrophilic or fluorophilic;

provided that:

when  $R_4$  is propyl,  $R_2$  is Br,  $R_3$  is H or Br, and  $R$  is Br, then  $R_1$  is other than H,  $OC(O)CH_3$  or OH;

when  $R_4$  is propyl,  $R_2$  is Br,  $R_3$  is H,  $R_9$  is I, then  $R_1$  is other than  $OC(O)CH_3$  or OH;

when  $R_4$  is propyl,  $R_2$  is Br,  $R_3$  is H,  $R_9$  is Cl, then  $R_1$  is other than OH;

when  $R_4$  is propyl,  $R_2$  is H,  $R_3$  and  $R_9$  are Br, then  $R_1$  is other than H; and

when  $R_4$  is propyl,  $R_2$  is Br,  $R_3$  and  $R_9$  are Cl, then  $R_1$  is other than H.